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DR. HORACE GREEN

ON THE INTRODUCTION

OF THE SPONGE-ARMED PROBANG

INTO THE LARYNX AND TRACHEA.

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ON THE INTRODUCTION
OF THE SPONGE-ARMED PROBANG
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To the Editors of the American Medical Monthly :

There appeared, a few days ago, in the *New York Daily Times*, a letter over the signature of "Malakoff," the Paris correspondent of that paper, which among other things contained the following declaration :

"A few days ago, Dr. Trousseau, while lecturing on an operation of tracheotomy (his two hundred and fifth operation of the same kind !) for the relief of croup, referred to the operation of Dr. Green, and spoke in the following words in regard to that operation :

"The learned professor denied that *anybody, anywhere*, ever introduced, after Dr. Green's method, the sponge-probang into the larynx. 'A student of Dr. Green's,' said M. Trousseau, 'who was here two years ago, a gentleman who professed to understand perfectly Dr. Green's method, who had himself practiced the operation under Dr. Green's eyes, attempted to perform the operation here, in this hospital, at my request. He failed entirely ; his probang arrived on the opening into the larynx, was pressed there, and then passed on into the œsophagus (the canal leading into the stomach). I convinced him of the fact. I have tried this operation very often,' continued M. Trousseau, 'after the directions of Dr. Green's Treatise on the subject. I had tried it long before the appearance of that Treatise, both on the living and on the dead subject. I have put all the good will possible into my experiments, and I have never been able to succeed. More than this, I have convinced myself that the operation after this method is IMPOSSIBLE, and that it has *never been accomplished by Dr. Green, or any one else.*' "

The writer furthermore avers that "the words of Trousseau quoted above, are the declarations of the profession of France thrown out to

the Faculty of New York, and that Dr. Green himself, and the Faculty of New York as well, owe it to themselves, after this speech of M. Trousseau, to endeavor to put this dispute once for all at rest. Either Dr. Green ought to be discarded from the profession and from his high position, or he ought to be declared *and proved* to be entitled to the honor of this important discovery."

This, then, is the *issue*, put in strong and emphatic language, on the question of the practicability or the impracticability of the operation! Admitting these to be the words of M. Trousseau, and the above negative opinions those of himself and of his confrères, then myself and my colleagues take the affirmative—we *accept the issue*.

But before we proceed any further, I must protest against the apparent effort on the part of "Malakoff" (who, from his language employed, appears to be a medical man), to make this matter of opinions only, a question of *veracity*.

Dr. Trousseau I have the honor to claim as a professional friend. At our interviews in Paris, we have exchanged opinions freely, but in the kindest manner. He has sent patients to my care in New York, and I have frequently advised them to his. When Prof. Trousseau and his distinguished colleagues affirm that the introduction of the sponge-armed probang into the larynx is impossible, they believe what they affirm; they are only simply *mistaken in this opinion*. For myself and my friends I claim the same consideration. Unfortunately, perhaps, opinions in medicine, even among the most distinguished of its professors, have occasionally been found directly at variance, and the writer in the *Times* should remember, in the history of medicine, that every discovery and all new doctrines advanced, have at first always met with opposition. When Harvey published his work on the circulation of the blood, "his views," say the historians of those times, "were at first rejected almost universally." The older intellects in possession of the seats and places of authority, regarded them as idle dreams. Joannes Riolanus, then the distinguished professor of Anatomy in the University of Paris, publicly assailed them; as did Hofman, the learned and laborious professor of Nuremburg, whom Harvey visited in vain, for the sake of demonstrating the truth of his discovery. And Jenner's discovery, likewise, met with no less formidable opposition than did that of Harvey. Paré, too, who first applied ligatures to arteries after amputation, was ridiculed by the French Faculty of Medicine, for "hanging

life on a thread, when boiling pitch had stood the test of centuries.”* So it has been in this country, as in Europe, in regard to every new medical doctrine. *Facts*, therefore, when established, must be received rather than *opinions* in medicine, however exalted the source from whence these emanate.

The ground and origin of the present controversy are briefly these : the air-passages are lined by a mucous membrane, similar in its nature to mucous membranes of other parts of the system, and liable to the same diseases—inflammation, ulceration, hypertrophy, etc.

In the treatment of many of the diseases of the mucous membrane, it has long been known to the profession that the topical or direct application of nitrate of silver to the affected parts, constitutes one of the most valuable measures that can be employed. Consequently, attempts were early made by such men as MM. Brettonneau and Trousseau, of France, and Sir Charles Bell and others in England, to reach directly, with this remedy, the mucous lining of the air-passages, whenever this membrane became affected by any of those serious diseases to which, as a mucous surface, it is liable ; it being well known that the same topical remedy, if it can be employed, is equally appropriate to the membrane of these passages, when diseased, as to that of any others.

“As early as the year 1818,” writes Prof. Trousseau, in a letter which I received from him two years since, “M. Brettonneau carried over the aryteno-epiglottic ligaments, several times a day, a sponge fastened to the extremity of a piece of whalebone, and charged either with pure chlorohydric acid, or with a saturated solution of nitrate of silver. He expressed (the fluid from) the sponge, at the entrance to the larynx, and the patient, in the convulsive movements of respiration, caused a certain quantity of the caustic solution to enter therein.

“When he performed the operation of tracheotomy, in the last stage of croup, he carried with a small sponge a caustic solution into the trachea, and into the larynx, and penetrated into the trachea by the wound which he had made.”

In 1830, M. Trousseau repeated the experiments of Brettonneau, in Paris, on a large scale, and treated with great success many cases of chronic diseases of the larynx, and croup also, by caustic applica-

* See Willis' "Life of Harvey," and Art. VIII., "Medical Despotism," in *Westminster Review*, Vol. LXV.

tions made to the superior portion of the organ, with the sponge-probang, and by expressing the solution into the cavity of the larynx, but without attempting, as he states, "the direct introduction of the sponge, saturated with a caustic solution, into the larynx." *

Successful as this practice had been—and it is well known to the profession, that practical medicine was greatly advanced by the labors of M. Trousseau, in this field—yet it was found, that when chronic inflammation, or ulceration had extended itself into the larynx, or trachea, the disease was not so certainly reached by applications to the opening of those passages only. Hence attempts were frequently made to introduce the remedy still deeper into these cavities.

In 1838, I returned to New York from Europe, where I had been to obtain, in the hospitals and schools, all the information I could, more especially, with regard to the treatment of diseases of the air-passages. Soon after my return, a strongly marked case of chronic laryngitis, or laryngeal phthisis, attended with ulcerations of the epiglottis and of the larynx and trachea, came under my care. The patient was much emaciated, had severe cough, with expectoration of purulent matter. In the same manner as practiced by Brettonneau and Trousseau, I made applications of a solution of the crystals of nitrate of silver to the ulcerated epiglottis and to the opening of the glottis. The ulcerations of the epiglottis were healed; but the cough, and the expectoration of purulent matter from the larynx and trachea continued; and the patient was evidently sinking under the local disease. I proposed to reach the ulcerations in the larynx and trachea, and had received the consent of the patient to perform tracheotomy for this purpose. In making repeated applications of the caustic solution to the opening of the glottis, I observed that the acute organic sensibility, peculiar to the glottis, which is limited to the narrow zone of mucous membrane that covers the supra-glottic space,—became daily more tolerant to the applications, and I determined to make the attempt to pass this point, and push the medicated sponge into the larynx. *The attempt was made, and was successful;* the instrument passed between the vocal chords, and entered the trachea. A spasmodic cough for a few minutes followed the operation. But the patient subsequently expressed himself greatly relieved. The operations were repeated daily, for a week or more, proving less

* See the entire letter of Prof. Trousseau, in AMERICAN MEDICAL MONTHLY for January, 1855.

and less irritative each time ;—then, every second or third day, for several successive weeks. The patient improved rapidly after the introduction of the sponge-probang into the larynx, and ultimately, quite recovered. He is alive at this day. During the following year, many other similar cases were treated after this manner, with the like success, for it was found that by properly preparing the parts—by repeated applications of the nitrate of silver solution, first to the fauces and pharynx, and then to the epiglottis and glottic opening ; in some cases for many successive days—to the supra-glottic-space—that the acute sensibility of this part, could be greatly diminished, and thus be made to tolerate the passage of the instrument.

In September, 1840, I brought before the New York Medical and Surgical Society, the subject of the treatment of disease of the larynx, by means of the direct application of therapeutical agents, to the lining membrane of this cavity, exhibiting to the Society the instruments by means of which the topical remedies were applied ; and reported fifteen cases of severe laryngeal and bronchial disease, in which permanent cures had been effected by this mode of treatment. Since that time, during a period of nearly eighteen years, I have been almost constantly employed in the treatment of that class of diseases in which topical medication has been conjoined with general remedies ; and during that period I have introduced the sponge-armed-probang into the larynxes and trachea of my patients, many hundred times every year. Within the past ten years, nearly five hundred physicians have been treated by topical medication, for diseases of the air-passages, and more than half this number have in the most positive manner declared their conviction that the instrument was passed below the vocal chords, into the larynx. Many eminent physicians, since this controversy commenced, have volunteered their testimony on this point.

I shall now proceed to give a series of proofs that cannot be set aside, to establish most conclusively the positive performance of this operation.

In 1854 I saw Professor Erichsen's valuable work, "The Science and Art of Surgery," published in London in 1853. In his work, this distinguished surgeon takes up the question, and declares it to be in his opinion "utterly impossible to pass a whalebone, whether curved or straight, armed with a sponge, beyond, or even between the two vocal chords." Mr. Erichsen has frequently endeavored to do this, in cases of cut-throat, "but in no one instance," says he, "have I succeeded in passing the sponge so as to made it appear at

the external wound." After seeing this statement, and having learned also, about the same time, that Professor Troussseau had, at the Hotel Dieu, in the presence of several medical gentlemen, expressed his conviction that the passage of a sponge-armed-probang into the larynx, cannot be effected, I determined to institute a series of experiments that should prove unanswerably its positive performance ; although, during all these years in which I had employed topical medication, I had never for a moment doubted its practicability. As in the investigation of this subject, almost every experiment which could in any way establish the affirmative of the question, has, in one way or another, been instituted by myself or my friends, I will, in as brief a manner as possible, particularize a few of them.

1. In the presence of medical men, I have repeatedly performed the following :—Selecting some person from among my patients, who was well prepared by previous operations, I have introduced a sponge-probang into the larynx, and letting go the handle for a moment, have quickly passed a second probang up and down the œsophagus, passing the former without disturbing it in the least degree. This any one may prove, cannot be done when both instruments are in the œsophagus.

2. In cases where stricture of the œsophagus has been present, through which the sponge-probang *could not be passed*, I have repeatedly, in the presence of surgeons—who had previously pushed the sponge-probang as far down the œsophagus as it could be carried—introduced the same instrument into the trachea four or five inches *below the stricture*.

In the presence of many physicians and surgeons—among them Dr. Sims, Professor E. H. Parker, Dr. Sayre, and my colleagues, Professors Barker, Davis, and Peaslee, of New York ; Dr. Bowditch, of Boston ; Professor Davis, of the University of Virginia ; Crowcour, of New Orleans ; Smith, formerly Surgeon in the Army of Mexico ; and others, whose names I cannot recall (all of whom will testify to their having seen some one or more of the experiments)—the following experiments were performed :

3. To the extremity of a flexible tube, of the size of Nos. 11 or 12, catheter, was attached a sponge of the same dimensions with those which are used with the ordinary throat-probang, but in such a manner as to preserve the opening in the side and near the end of tube, free. Wetting the sponge in a strong solution of nitrate of silver, and selecting a patient who had been some weeks under treatment for disease of the windpipe, into whose larynx and trachea I

had introduced many times (as I believed) the sponge-armed-probang ; I passed this instrument, in the presence of several of these gentlemen, down to the vocal chords, through the rima-glottidis, and several inches into the trachea ; then withdrawing the wire from the tube, the patient was directed to close his lips, and breathe through the tube. This he did for several moments, filling and emptying the chest of air repeatedly. A lighted lamp was then extinguished several times *by blowing through the tube*.

4. Into the trachea of another patient, the organic sensibility of whose glottis had been reduced by repeated applications, the sponge-armed tube was introduced in the same manner, and then one of the physicians present closed completely the anterior nares, and compelled the patient to breathe only through the tube. This he did for several minutes, respiration being performed freely through the inserted tube. With regard to this case, Dr. Sayre, an eminent surgeon of this city, thus testified before the Academy of Medicine, when the discussion on this subject took place, with that body, some time ago : "The instrument was introduced," said Dr. Sayre, "without producing any of the alarming symptoms stated in the majority report." Dr. Sayre then closed the mouth and held the nostrils shut, so that no air could, in any manner, enter the lungs except through the tube. "I was determined," said he, "to test this case thoroughly. The patient breathed thus for several minutes. He then showed signs of suffocation, and Dr. Sayre was on the point of opening his nose and mouth, but Dr. Green said that the trouble arose from the tube being stopped with mucus. Dr. Sayre then blew forcibly into the tube—the patient was instantly relieved, and remained a considerable time longer in that condition, breathing, without trouble, through the catheter."*

The above experiment was repeated subsequently, over and over again, always with similar results ; and in each instance in the presence of several medical men ; care being always taken (and this has been insisted upon, from the beginning of this treatment,) that the glottis be thoroughly prepared, before the attempt was made to introduce the instrument below the vocal chords. But we have testimony still more positive to prove the affirmative of the question.

5. Soon after the discussion in the New York Academy commenced, to which "Malakoff" refers, my colleague, Prof. Carnochan, called on me, and stated that there was then "in his office a patient

* American Medical Monthly, August, 1855.

who a twelvemonth before, in a fit of insanity, attempted suicide by cutting his throat ; the wound had never perfectly healed, and that this case would afford me an opportunity of demonstrating positively, that the disputed operation can be performed, as a small permanent opening into the trachea still remained. Taking with me an ordinary sponge-probang, such as I am accustomed to use daily, in the treatment of my patients, I accompanied Dr. Carnochan to his rooms, and in his presence, at the second attempt, and without much difficulty, I introduced this instrument through the rima-glottidis into the larynx, until the sponge made its appearance and was seen by Prof. Carnochan, *at the opening in the trachea.*

6. I have had recently under my care a young woman, upon whom the operation of tracheotomy was performed several years ago. An opening into the trachea, just above the top of the sternum, has remained ever since. But the opening being quite small, and passing obliquely into the trachea, it is impossible to see into this tube. This patient was under my care for chronic pharyngo-laryngeal inflammation, for which she was successfully treated by topical medication.

As this appeared to be an excellent case to prove the practicability of the operation in question, for the patient breathed much of the time through the larynx, I determined to make the attempt to pass the sponge-probang through the trachea to the opening. To prove its presence at this point (for it could not be seen through the small oblique opening), my assistant, Dr. Richards, bent a small wire of German silver, and passing the bent wire into the opening, sufficient to have it just penetrate into the trachea, retained it there, while I passed the sponge-probang, wet with the nitrate of silver solution, quickly down the trachea upon the bent wire. The meeting of the sponge with the wire was plainly felt, and on withdrawing the latter, it was blackened by its contact with the caustic. This operation was repeated a number of times, in the presence of several physicians, and with the same result.

It would seem as if the above experiments were sufficient to prove to any candid member of the profession, that the introduction of the sponge-probang into the larynx *is possible*. But I shall take the liberty of appending to my own, the direct testimony of a few distinguished members of the profession, who have repeatedly performed this operation themselves, or into whose own larynges the sponge-probang has been introduced, and then submit to the profession, in France and America, whether as M. Trousseau affirms, the operation

"IS IMPOSSIBLE, and that it has never been accomplished by Dr. Green or any one else?"

Dr. Conant, one of the most accomplished anatomists of this city, and Professor of Surgery in the University of Vermont, testifies as follows :

DR. GREEN :—*My Dear Sir*,—In 1854, soon after Prof. Erichsen's work was published, I was appointed physician in the Mott Street Cholera Hospital ; and as, at that time, the question, of the practicability of introducing the sponge-probang into the larynx, was much agitated, I made many experiments upon the cadaver. In more than one hundred cases, I succeeded in passing the sponge-probang into the trachea ; in more than fifty of these cases, I performed tracheotomy, and in every instance found the sponge in the trachea. Many of these operations were witnessed by members of the profession in this city. I have also operated many times since, before my classes in the dissecting room, and before the public classes in the University of Vermont, and always with the same result. Never, in any of the operations I have performed, have I experienced the difficulty spoken of by Prof. Erichsen ; nor have I, in a single instance, found the probang distorted into those "extraordinary curves" which he has represented in the article on this subject, published in the *London Lancet* for December, 1855. The operation on the cadaver is so perfectly easy that students are as readily taught its performance as the introduction of the catheter into the bladder. Upon the living, the operation is more difficult, but perfectly practicable. I have seen Prof. Carnochan pass the sponge-armed-probang down to the opening made in the trachea of a cut-throat. By the kindness of Dr. Turner, of the Kings County Hospital, I had an opportunity, on the 22d instant, to try the operation upon an adult, and also upon a young child, in both of whom tracheotomy had been performed, and was successful in both cases, in passing the sponge-probang into the trachea.

Yours truly,

D. S. CONANT.

From Dr. Barker, Professor of Midwifery in the New York Medical College.

My Dear Doctor,—In reply to your note, I am most happy to say that I have had conclusive evidence that the sponge-probang has been passed through the larynx into the trachea in repeated instances :

1st. In a patient of Dr. Carnochan's, who, in a fit of delirium

during illness, had attempted to commit suicide by cutting his throat, there remained a permanent opening into the trachea. I saw Dr. Carnochan pass the sponge-probang down through the larynx until the sponge made its appearance at the opening of the trachea.

2d. In another patient that I saw at your office, there was a stricture of the œsophagus from malignant disease, about four inches below the pharynx, through which a tube could not be passed; yet I saw you, in the presence of several other medical men, pass the sponge-probang down at least ten inches.

3d. In some few patients of my own, I have distinctly seen and felt the sponge externally about an inch above the sternum. When passed down the œsophagus, it can neither be seen nor felt externally.

4th. I have heard intelligent patients, many of them medical men, and able to determine the point by their own sensations, *affirm* the passage of the sponge into the trachea. I see no reason for discrediting their statements.

5th. I regard the *positive* testimony of such men as Prof. Bennett and Dr. Scott, of Edinburgh, Dr. Watson, of Glasgow, Dr. Cotton, at the Hospital for Consumption at Brompton, Dr. Hastings, of London, and many others, distinguished in this department of practical medicine, that they have, in numerous instances, performed this operation, as far outweighing any amount of *negative* testimony, from "anybody anywhere." *Negative testimony*, under these circumstances, is simply a confession of individual incompetency and inability.

6th. That there is no anatomical impossibility in passing the sponge through the larynx into the trachea, is proved from the fact that the operation can be easily, and has been repeatedly, demonstrated on the cadaver.

Very sincerely yours,

FORDYCE BARKER.

70 UNION PLACE, July 25, 1857.

45 LAFAYETTE PLACE, July 29th, 1857.

My Dear Sir,—As the possibility of passing the tracheal probang, armed with the sponge, has been recently discussed, I beg leave to contribute the following observation, which in connection with your exposition of the entire question, is sufficient to convince me that the operation can be performed.

About ten months ago I was waited upon by a young man, who had attempted self-destruction by cutting his throat. The line of the incision when seen by me, about twelve months after the attempt, extended across the anterior portion of the throat, and the trachea

had been divided through three-fourths of its calibre, immediately below the cricoid cartilage. The patient used a tracheal tube through the aperture made by the wound, and thus performed the function of respiration with great ease. Nevertheless, he was very desirous of having the aperture closed, and of getting rid of the use of the tube.

Upon withdrawing the tube, and closing, for the moment, the aperture in the trachea, respiration became exceedingly difficult, owing to the falling forward of the larynx, and to a partial contraction of the respiratory tube above the wound. This, of course, deterred me from performing any autoplasmic operation, for the purpose of closing the aperture. Proceeding, however, to try and effect a dilatation of the interior of the larynx, I began by passing flexible bougies through the aperture, from below upwards into the larynx.

The first trials were attended with violent spasmodic action, during which the patient seemed threatened with asphyxia. After a time, however, the paroxysms ceased to manifest themselves, and the patient became enabled to pass the bougies with his own unaided hand, so that the beak could be seen in the cavity of the mouth.

Seeing the feasibility of passing an instrument from below upwards through the rima-glottidis, I was induced to make the experiment of passing the sponge-probang in the contrary direction, by the mouth, from above downwards, and succeeded in doing so, the sponge presenting itself at the aperture in the trachea. Subsequently, at my request, and in my presence, you performed the same operation upon the same patient, using a probang with a sponge measuring between five and six lines in diameter when expanded.

To conclude, it is my opinion that the muscles called constrictors of the larynx, were not in any way paralyzed.

I am, dear Sir, with much respect, very truly yours,

J. M. CARNOCHAN.

Prof. HORACE GREEN.

We do not deny the difficulties which attend the operation for the direct medication of the air-passages, or rather those which are met with in preparing our patients for its employment. These, however, in most cases, may be overcome; and happily, in the treatment of several mortal diseases—as membranous croup and œdema glottidis—these preparatory measures are not necessary.

I have in my possession the written testimony of a large number of intelligent physicians, from different parts of the United States,

who have been under my care for the treatment of laryngeal, or bronchial disease, who affirm, in the most positive manner, that they have had, in their own cases, *the sponge-armed-probang introduced repeatedly into the trachea.*

But this testimony I must omit for the present, and shall close this long communication by a reference to an opinion expressed by Prof. Trousseau himself, in his writings in 1837, and to an interesting fact in the history of medicine. "The entire generation of medical men," say MM. Trousseau and Pidoux, in their System of Medicine, "turns its back on truth, and will have to march perhaps for some time yet in error, until they shall fall by its own consequences." The historical fact to be remembered is this, that the immortal Harvey himself opposed to the last, Aselli's important discovery of the lacteals and lymphatics, vessels which are absolutely necessary to complete his own theory !

HORACE GREEN.

